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XXIV.—*On a new Species of Synocladia from the Carboniferous Limestone Series of Midlothian.* By R. ETHERIDGE, Jun., F.G.S.

[Plate X.]

ONLY one species of *Synocladia* is at present recorded, so far as I am able to ascertain, from rocks of Upper Palæozoic age in Great Britain—the *S. virgulacea*, Phillips, from the Magnesian Limestone of Tunstall Hill and other localities in the north of England. A bed of bluish-grey shale was lately discovered overlying the Gilmerton Limestone (Lower Carboniferous Limestone series) at Gilmerton, near Edinburgh, by Mr. J. Bennie, crammed with the remains of *Fenestellæ* and other Polyzoa. Amongst a number of such fragments I was much interested with certain pieces evidently not referable to that genus, but clearly allied to *Synocladia*.

The specimens present the same habit as the Permian genus, but differ from the latter in the arrangement of the cell-apertures on the celluliferous or obverse face. This arrangement departs considerably from the hitherto recognized *Synocladia* type, in many points approaching that seen in *Fenestella*, yet distinct from it. Were it not that the other characters displayed in the habit of the carboniferous form so closely resemble those seen in *Synocladia*, I should feel considerable diffidence in referring my specimens to that genus. If it, *i. e.* the carboniferous form, is not a new species of *Synocladia*, then a new genus must be created for its reception—allied to *Synocladia*, yet differing from it.

As in the typical species, *S. virgulacea*, the frond is com-

posed of numerous rib-like stems, rising from a common root and frequently bifurcating. The branches are short and simple, and spring at an ascending angle from one stem to meet those of the opposite stem, and thus form the peculiar arch-like dissepiments so characteristic of the genus; these are sometimes modified into stems. The form of the dissepiments is regulated by the proximity to or remoteness from one another of the stems or interstices: when far apart the usual arch-like character is preserved; but when brought close together, the normal form is lost, and the dissepiments become irregular connecting bars, passing from rib to rib, either horizontally or at a more or less acute angle.

So far the resemblance between the Carboniferous and Permian forms is complete; but, as before stated, a considerable difference is noticeable in the detailed arrangement of the cells on the celluliferous face, although the general plan is the same. In *S. virgulacea* the cell-apertures on the stems are arranged in from three to five furrows, separated by sharp or angular ridges or keels, on which may be seen small, open, node-like elevations ("gemmuliferous vesicles," King); the cell-apertures on the branches are restricted to two rows, with a dividing ridge between them, the cellules set alternately. In the Carboniferous species, on the other hand, there is only one dividing ridge or keel on each stem, separating two rows of cell-mouths, and that not angular, but somewhat round, with the open node-or pore-like elevations arranged in the same manner as in *S. virgulacea*. Furthermore, scattered in a most irregular manner amongst the cell-apertures proper are a number of supplementary openings, without any attempt at arrangement; sometimes one may be seen between two of the cell-apertures proper, more commonly at the side of a primary opening, or occasionally as many as three have been observed clustered close together; this usually takes place at the base or setting-off of one of the branches, upon which they are also to be found. The disposition of the cells on the branches is similar to that seen in *S. virgulacea*, with this one exception; viz. the "gemmuliferous vesicles" (?) are continuous from the keel of the stems on to that of the branches. This I cannot ascertain to be the case in the Permian form.

From the foregoing remarks it is evident that our Carboniferous Polyzoon, whether it is a *Synocladia* or not, differs from that genus, as defined by King, as follows:—

1st. Obverse of the main stem supplied with two rows of cells only, separated by a rounded keel.

2nd. Reverse provided with irregularly scattered supplementary cell-apertures.

3rd. Keel of the branches supplied with node-like pores, the "gemmaiferous vesicles" (?) of King.

The points of difference expressed in the first paragraph do not to my mind present an insurmountable difficulty to the admittance of the Carboniferous specimens into the genus *Synocladia*. I feel the greater confidence in so placing them, because Prof. King in his generic diagnosis does not lay particular stress on the number of rows of cellules, but simply says "distributed in longitudinal series," whereas it is only in the specific diagnosis we find it stated that the cellules are "in from three to five furrows."*

The second and third points of difference are those only which make me doubt the propriety of referring these peculiar Polyzoa to *Synocladia*, viz. the possession of the supplementary irregularly scattered cell-apertures (if that is their true nature) and the occurrence of the gemmaiferous vesicles on the keels of the branches as well as on the stems.

The reverse or non-celluliferous face of *S. virgulacea* is represented by Prof. King as smooth; but in the Carboniferous specimens it is seen to be delicately and regularly striate, with (scattered over the surface of both stems and branches) small, round, open, pore-like apertures. The question arises, are these the bases of the "root-like processes" on the underside of the fronds mentioned by Prof. King as seen in the Permian specimens? or, if not, what are they? If the former, then the processes must have been broken off in the course of fossilization. They occupy exactly the position of the root-processes as shown in the 'Permian Fossils'†.

I propose to describe this form provisionally as a new species of *Synocladia*, under the specific name of

Synocladia carbonaria, sp. nov.

Polyzoarium a flattened plumose expansion, springing from a small root of attachment.

Interstices or stems rib-like, frequently bifurcating, much stouter and stronger than the branches; obverse celluliferous, with a median rounded keel; reverse rounded and striated.

Dissepiments or branches short and simple, opposite branches given off at an oblique angle from their respective stems, which meeting, give rise to arched interspaces or fenestrules; obverse celluliferous; reverse rounded and striate; sometimes modified into stems.

Dividing ridges or keels on both stems and branches se-

* Permian Fossils, pp. 38 & 39.

† Plate iv. figs. 7 & 8.

parating the two rows of cell-apertures; those on the stems rounded, those on the branches slightly angular; both bear the wart-like bodies termed by King "gemmaiferous vesicles" (?).

Fenestrules, when the stems and branches assume their normal condition, are arch-shaped, otherwise irregular; margins not indented by cells.

Cell-apertures arranged in two subalternating rows, both on the stems and branches, separated by the median keel; with prominent margins.

Supplementary cell-apertures scattered irregularly amongst the primary cell-apertures, either singly or in twos and threes.

Gemmaiferous vesicles (?) open node-like protuberances placed on the keels of both stems and branches, alternating with the cell-apertures.

Reverse or non-celluliferous face regularly and finely striate, or rather granulo-striate; scattered at random over the surface are open wart-like projections, which may be the broken bases of the "root-like processes" of King.

EXPLANATION OF PLATE X.

Fig. 1. *Synocladia carbonaria*, nat. size. The dotted lines show the extent of the specimen and direction of the stems and branches.

Fig. 2. Portion of a specimen, showing the celluliferous face: (*a*) the cell-apertures, and indistinctly the keel (*d*).

Fig. 3. Portion of another specimen, showing the celluliferous face, on which are seen:—*a*, cell-apertures; *b*, gemmaiferous vesicles; *c*, smaller cellule apertures; *d*, median keel; *e*, the same on the branches; *f*, gemmaiferous vesicles (?) on the keels of the branches.

Figs. 4 & 5. Reverse or non-celluliferous face, showing the arch-like dissepiments and the bases of the root-like appendages (?).

Figs. 2 to 5 are all very considerably enlarged.

Note. Since writing the above I have submitted the facts mentioned in the foregoing remarks to Prof. King, who considers this to be a species of *Synocladia*. The late Dr. Prout described, in the 'Transactions of the Academy of St. Louis,' a form very similar to the above under the name of *Septopora cestrionensis* (vol. i. p. 448, pl. xviii. fig. 2). Dr. Prout established the genus *Septopora* on characters which cannot be distinguished from those of *Synocladia*, King, with this exception, that the cell-apertures on the interstices are in from one to four rows; whereas, so far as I can ascertain from Prof. King's description and figures of *Synocladia*, there never appear to be more than two rows in the latter genus. This could scarcely be construed into a generic difference, but may be regarded as specific only. In framing the genus *Septopora* it is strange that so

acute an observer as Dr. Prout should have overlooked the characters of Prof. King's genus *Synocladia*. Our Scotch form and *S. cestriensis*, Prout, agree very closely, so far as I can judge from descriptions and figures, and appear to differ only in a much greater irregularity of branching in the case of *S. carbonaria*, and also in its having, as in *Synocladia*, the cell-apertures arranged in two rows on the interstices. Dr. Prout's figure does not give a good idea of this peculiar polyzoon; but I have been favoured by Prof. King with extracts and photographs from a letter to himself from Mr. F. B. Meek, of Springfield, Illinois, regarding the question of *Septopora* and *Synocladia*. These photographs show that the American specimens are in a much better state of preservation than the Scotch; and although the points of difference between the two are slight, I think they are of sufficient importance to warrant a specific separation; however, should Mr. Meek have previously elsewhere described any form nearer *S. carbonaria* than *Septopora cestriensis*, my designation can give place to his; in the mean time I retain for the Scotch fossil the name of *S. carbonaria*. Mr. Meek states that fuller descriptions and figures will be given in the forthcoming fifth volume of the 'Geological Survey of Illinois.'

Edinburgh, August 11, 1873.

XXV.—On the Longicorn Coleoptera of Japan.

By H. W. BATES, F.L.S.

[Continued from p. 156.]

Fam. Cerambycidae.

Section B. *Eyes finely faceted. Habits diurnal.*

Toxotus caeruleipennis, n. sp.

T. elongatus, subparallelus (♂), niger, thoracis margine antico vitæque laterali, et annulo basali femorum anticorum flavo-testaceis; elytris saturate caeruleis, planis, confertim ruguloso-punctatis, interstitiisque subtilissime coriaceis, apice truncatis, angulo suturali dentato, exteriore late rotundato. Long. 9 lin. ♂.

Japan? (*Fortune*). Possibly from North China, as Mr. Fortune's collections from the two countries were mixed together when I saw them.

Elytra more elongate than in the same sex of *T. meridianus*, and of quite different shape, being broad and rectangular at the base, then slightly narrowing to beyond the middle, and widening again before the apex; the whole surface roughly, but not very coarsely, sculptured. The thorax is much more strongly tuberculated, glabrous on the disk; there are two strong rounded tubercles on each side the median sulcus, and